

# **Exhibit F**

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF TEXAS  
MARSHALL DIVISION**

GESTURE TECHNOLOGY  
PARTNERS, LLC,

Plaintiff

v.

HUAWEI DEVICE CO., LTD.,  
HUAWEI DEVICE USA, INC.,

Defendants.

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CASE NO. 2:21-cv-00040-JRG  
(Lead Case)

JURY TRIAL DEMANDED

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GESTURE TECHNOLOGY  
PARTNERS, LLC,

Plaintiff

v.

SAMSUNG ELECTRONICS CO., LTD.  
AND SAMSUNG ELECTRONICS  
AMERICA, INC.,

Defendants.

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CASE NO. 2:21-cv-00041-JRG  
(Member Case)

JURY TRIAL DEMANDED

**DECLARATION OF DEFENDANTS' EXPERT ROBERT LOUIS STEVENSON, PH.D.,  
ON CLAIM CONSTRUCTION**

## TABLE OF CONTENTS

	Page
I. INTRODUCTION .....	1
II. QUALIFICATIONS AND EXPERIENCE .....	4
A. Background and Experience .....	4
B. Significant Research .....	5
C. Publications And Conferences.....	6
D. Compensation and Previous Expert Opinions .....	6
III. LEGAL PRINCIPLES .....	7
IV. LEVEL OF ORDINARY SKILL IN THE ART .....	10
V. OVERVIEW OF THE ASSERTED PATENTS.....	11
A. The '431 Patent.....	11
B. The '924 Patent .....	11
C. The '079 Patent.....	11
D. The '949 Patent.....	12
VI. DISPUTED CLAIM TERMS .....	12
A. '431 Patent .....	12
1. “means for controlling a function of said apparatus using said information” .....	12
2. “computer means within said housing for analyzing said image to determine information concerning a position or movement of said object” .....	18
3. “display function which is controlled” .....	23
4. “sensing means associated with said device” .....	25
5. “a camera means associated with said housing for obtaining an image using reflected light of at least one object positioned by a user operating said object” .....	28
6. “means for transmitting information” .....	29
B. '924 Patent .....	31
1. “a computer within the housing . . . wherein the computer is adapted to perform a control function of the handheld device based on at least one of the first camera output and the second camera output” .....	31
C. '079 Patent .....	34

## TABLE OF CONTENTS

	Page
1. “a processor adapted to determine the gesture performed in the work volume and illuminated by the light source based on the camera output” .....	34
D. '949 Patent .....	37
1. “a processing unit within the device housing and operatively coupled to an output of the electro-optical sensor, wherein the processing unit is adapted to: determine a gesture has been performed in the electro-optical sensor output, and control the digital camera in response to the gesture performed in the electro-optical sensor field of view, wherein the gesture corresponds to an image capture command, and wherein the image capture command causes the digital camera to store an image to memory.” (Claims 1-2); “a processing unit” (Claims 8-9); “processing unit operatively coupled to the sensor and to the digital camera, wherein the processing unit is adapted to: detect a gesture has been performed in the electro-optical sensor field of view based on an output of the electro-optical sensor, and correlate the gesture detected by the sensor with an image capture function and subsequently capture an image using the digital camera, wherein the detected gesture is identified by the processing unit apart from a plurality of gestures.” (Claims 13-14).....	37
2. “forward facing portion” / “forward facing light source” .....	41
3. “the detected gesture is identified by the processing unit apart from a plurality of gestures” .....	43

I, Robert Louis Stevenson, Ph.D., hereby state and declare:

## **I. INTRODUCTION**

1. I am over the age of 18 and am competent to make this declaration. I have personal knowledge, or have developed knowledge, of these technologies based upon my education, training, and/or experience, of the matters set forth herein.

2. I have been retained by counsel for Defendants Huawei Device Co., Ltd., Huawei Device USA, Inc., Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively, “Defendants”), in the above captioned matter to offer opinions as to the scope and meaning that would have been given to certain disputed terms and phrases in U.S. Patent No. 7,933,431 (the “’431 Patent”), U.S. Patent No. 8,194,924 (the “’924 Patent”), U.S. Patent No. 8,553,079 (the “’079 Patent”), and U.S. Patent No. 8,878,949 (the “’949 Patent”) (collectively, the “Asserted Patents”) by one of ordinary skill in the art at the time of the invention.

3. I have been asked by counsel to provide my opinions on the construction the following disputed claim terms:

Patent	Proposed Claim Term	Claim(s)
’431 Patent	“sensing means associated with said device”	1
’431 Patent	“a camera means associated with said housing for obtaining an image using reflected light of at least one object positioned by a user operating said object”	7
’431 Patent	“computer means within said housing for analyzing said image to determine information concerning a position or movement of said object”	7

'431 Patent	"means for controlling a function of said apparatus using said information"	7
'431 Patent	"display function which is controlled"	9
'431 Patent	"means for transmitting information"	11
'924 Patent	"a computer within the housing . . . wherein the computer is adapted to perform a control function of the handheld device based on at least one of the first camera output and the second camera output"	1, 6-8, 10-14
'079 Patent	"a processor adapted to determine the gesture performed in the work volume and illuminated by the light source based on the camera output"	11
'949 Patent	"a processing unit within the device housing and operatively coupled to an output of the electro-optical sensor, wherein the processing unit is adapted to:  determine a gesture has been performed in the electro-optical sensor output, and control the digital camera in response to the gesture performed in the electro-optical sensor field of view, wherein the gesture corresponds to an image capture command, and wherein the image capture command causes the digital camera to store an image to memory."	1
'949 Patent	"processing unit"	8

'949 Patent	“processing unit operatively coupled to the sensor and to the digital camera, wherein the processing unit is adapted to: detect a gesture has been performed in the electro-optical sensor field of view based on an output of the electro-optical sensor, and correlate the gesture detected by the sensor with an image capture function and subsequently capture an image using the digital camera, wherein the detected gesture is identified by the processing unit apart from a plurality of gestures.”	13
'949 Patent	“forward facing portion”	1, 8, 13
'949 Patent	“forward facing light source”	16
'949 Patent	“the detected gesture is identified by the processing unit apart from a plurality of gestures”	13

4. For purposes of this declaration, I have not been asked to opine on the meaning of any other disputed terms not identified above.

5. In rendering my opinions, I reviewed the intrinsic evidence, including the text of the Asserted Patents, their file histories, references incorporated by the Asserted Patents, extrinsic evidence, and the parties’ Patent Rule 4-2 disclosures. My opinions are based on my years of education, training, research, knowledge, and personal and professional experience in the relevant art.

6. I reserve the right to supplement and/or amend my opinions in this declaration based on future opinions taken by the parties, their experts, additional documents, testimony, or

other information provided by the parties or their witnesses, any orders from the Court, or as otherwise necessary.

## **II. QUALIFICATIONS AND EXPERIENCE**

### **A. Background and Experience**

7. I have a Bachelors degree in Electrical Engineering from the University of Delaware and a Ph.D. degree in Electrical Engineering from Purdue University. My Ph.D. research was on communications and signal processing.

8. I am presently a Professor in the Department of Electrical Engineering at the University of Notre Dame. I first joined the faculty at the University of Notre Dame as an Assistant Professor in the Department of Electrical Engineering in 1990. I was granted tenure and promoted to the rank of Associate Professor in August 1996. I attained the rank of Professor in the Department of Electrical Engineering in August 2002, and I continue to serve in that capacity. I have served concurrently as a Professor in the Department of Computer Science and Engineering at the University of Notre Dame from January 2003 through June 2018.

9. Since 2013 I have served as an Associate Chair of the Department of Electrical Engineering. I also serve as the Director of Undergraduate Studies in Electrical Engineering. In this role I oversee the department's undergraduate program in Electrical Engineering.

10. I spent the summer of 1992 at the Air Force Research Lab in Rome, New York and I spent the summer of 1993 at the Intel® Corporation in Hillsboro, Oregon. Several leading computing companies, including Intel®, Sun Microsystems®, Apple® Computer, and Microsoft®, have supported my research at Notre Dame. During the past 20 years, I have published over 150 technical papers related to the field of image and video system and their implementation in digital systems.



11. I am a member of the Institute of Electronics and Electrical Engineers, The International Society for Optical Engineering, and the Society for Imaging Science and Technology. I am a member of the academic honor societies Eta Kappa Nu, Tau Beta Pi, and Phi Kappa Phi.

**B. Significant Research**

12. For the past 30 years my work has focused on the design of techniques, hardware, and software for the processing of digital signals using digital computing devices. As an academic researcher I attempt to develop novel ideas for systems, then publish and present those ideas to the technical community. My success as an academic is directly related to the insights and techniques that provide the basis for new generations of products. My early work on digital techniques for printing and image capture devices led to significant interaction with companies developing desktop computers products in the early 1990's as they tried to incorporate those ideas into their products.

13. My interaction with Apple's Imaging Group focused on various imaging devices such as digital cameras, scanners, and printers and how to best support those devices on desktop computers. At Intel, I worked in Intel's Architecture Lab as part of the video conferencing group. My work there dealt with developing video compression techniques for CD-ROM's and network communications that were well matched to the Pentium architecture. I also gave a series of talks on how advanced communication and video processing techniques could be better supported on the Pentium platform. Similarly, my interaction with Sun Microsystem's group examined how advanced signal processing techniques could be best implemented using Sun's new Visual Instruction Set on the Sparc architecture. From 1995 through 1998 I received funding from Motorola to studying and design new systems for streaming video to handheld cellular devices.

14. I have also received significant support for my research from several U.S. Department of Defense Agencies. The Air Force Research Laboratory has funded my work to develop advanced parallel processing algorithms that exploited an ad-hoc network of mixed computers to achieve significant computational advantages over their previously implemented techniques. Other Department of Defense agencies have supported my work in image and video enhancement.

**C. Publications And Conferences**

15. I have published over 150 papers in international journals and international conferences.

16. I am an inventor of U.S. Patent No. 6,081,552, "Video Coding Using a Maximum A Posteriori Loop Filter," June 27, 2000.

17. Additional information concerning my background, qualifications, publications, conferences, honors, and awards are described in my Curriculum Vitae, a copy of which is attached with this Report as Exhibit A.

**D. Compensation and Previous Expert Opinions**

18. I am being compensated at my usual rate of \$650/hour for each hour of service that I provide in connection with this case, including time I spend consulting, writing this report, giving deposition testimony and testifying. My compensation does not depend in any way on the content of my testimony and is not affected by the outcome of the case. If called to testify as to the contents of this report, I can and would testify truthfully and competently.

19. A listing of previous cases in which I have provided expert testimony in the past four years can also be found in Exhibit B.

### **III. LEGAL PRINCIPLES**

20. I have been informed by counsel for Defendants that the following principles of law are applicable to claim construction, and I have applied these principles in my analysis.

21. The claims of a patent define the limits of the patentees' exclusive rights. In order to determine the scope of the claimed invention, courts typically construe claim terms when the meanings are disputed by the parties. Claim terms should generally be given their ordinary and customary meaning as understood by one of ordinary skill in the art at the time of the invention after reading the patent and prosecution history.

22. Claims must be construed, however, in light of, and consistent with, the patent's intrinsic evidence. Intrinsic evidence includes the claims themselves, the written disclosure in the patent's specification, and the patent's file history, including the prior art that was considered by the United States Patent and Trademark Office ("PTO").

23. In the specification, a patentee may also define his own terms, give a claim term a different meaning than it would otherwise possess, or disclaim or disavow claim scope. A court may generally presume that a claim term possesses its ordinary meaning. This presumption, however, does not arise when the patentee acts as his own lexicographer by explicitly defining or re-defining a claim term. This presumption of ordinary meaning can also be overcome by statements, in the specification or prosecution history of the patent, of clear disclaimer or disavowal of a particular claim scope.

24. The prosecution history can inform the meaning of the claim language by demonstrating how the patentee and the PTO understood the invention and whether the patentee limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be. A patentee may also define a term during the prosecution of the patent.

The patentee is precluded from recapturing through claim construction specific meanings or claim scope clearly and unambiguously disclaimed or disavowed during prosecution.

25. Courts can also consider extrinsic evidence when construing claims. Extrinsic evidence is any evidence that is extrinsic to the patent itself and its prosecution history. Examples of extrinsic evidence include technical dictionaries, treatises, and expert testimony. I understand that extrinsic evidence is less significant than the intrinsic record in determining the meaning of claim language.

26. A claim is indefinite if its language, when read in light of the specification and prosecution history, fails to inform persons having ordinary skill in the art about the scope of the claimed invention with reasonable certainty. I have been informed by counsel that reasonable certainty does not require absolute precision.

27. I am informed that if the word “means” is used in a claim limitation, there is a rebuttable presumption that § 112, ¶ 6 is applicable. This presumption may be overcome and § 112, ¶ 6 will not apply if the claim itself recites sufficient structure for performing the claimed function.

28. On the other hand, when a claim term lacks the word “means,” there is a rebuttable presumption that § 112, ¶ 6 is not applicable. This presumption can be overcome and § 112, ¶ 6 will apply if it can be demonstrated that the claim term fails to recite sufficiently definite structure or else recites function without reciting sufficient structure for performing that function. The claim language itself may provide sufficient structure if it is not necessary to resort to other portions of the specification or extrinsic evidence for an adequate understanding of the structure.

29. I am informed by counsel that if § 112, ¶ 6 is applicable for a particular claim limitation, then the specification must clearly link or associate structure to the function recited in the claim. Even if the specification discloses corresponding structure, the disclosure must be of adequate corresponding structure to achieve the claimed function. I am informed by counsel that if such structure is disclosed, then the limitation is limited to that structure and its equivalents. On the other hand, I am informed by counsel that if no adequate corresponding structure is disclosed, then the claim limitation is indefinite. I have been informed by counsel that the testimony of one ordinary skill in the art cannot supplant the total absence of structure from the specification. I have been informed that it is irrelevant to the indefiniteness inquiry whether a person of ordinary skill in the art would find it obvious to derive otherwise missing structure.

30. I am informed by counsel that in at least certain situations, material incorporated by reference cannot be relied upon for providing structure for a claim limitation governed under § 112, ¶ 6. I have nevertheless considered the material incorporated by reference in the asserted patents in forming my opinions.

31. I am informed by counsel that for a computer-implemented means-plus-function limitation that cannot be performed by a general purpose computer without additional programming, the disclosed structure under § 112, ¶ 6 is not just a general purpose computer, but also the algorithm implemented by the computer. Therefore, for a computer-implemented means-plus-function limitation, the specification must disclose more than a general purpose processor—it must disclose an algorithm for performing the entire claimed function. I am informed that if no algorithm is disclosed for a computer-implemented means-plus-function limitation, then the claim is indefinite.

32. I have been informed by counsel that mere reference to a general purpose computer being appropriately programmed without providing an explanation of the appropriate programming, or simply reciting “software” without providing detail about the means to accomplish a specific software function, would not be an adequate disclosure of the corresponding structure to satisfy the requirement of definiteness under U.S. patent law. Further, merely referencing a specialized computer (e.g., a “bank computer”), some undefined component of a computer system (e.g., an “access control manager”), “logic,” “code,” or elements that are essentially a black box designed to perform the recited function, will not be sufficient because there must be some explanation of how the computer or the computer component performs the claimed function.

33. I am informed by counsel that a patentee may express the algorithm in any understandable terms, including as a mathematical formula, in prose, as a flowchart, or in any other manner that provides sufficient structure.

34. I am informed by counsel that if multiple functions are claimed for the same element, the patentee must disclose adequate corresponding structure to perform all of the claimed functions. For a computer-implemented means-plus-function limitation, I am informed by counsel that the specification must disclose an algorithm sufficient to perform the entire claimed function, not merely parts of the claimed function. That is, when the specification discloses an algorithm that only accomplishes one of multiple identifiable functions performed by a means-plus-function limitation, the specification is treated as if it disclosed no algorithm.

#### **IV. LEVEL OF ORDINARY SKILL IN THE ART**

35. I understand that the claims must be understood from the perspective of a person of ordinary skill in the art (“POSITA”) at the time of the invention. I have been informed that factors in determining the level of skill in the art include the education level of those working in

the field, the sophistication of the technology, the types of problems encountered in the art, prior art solutions to those problems, and the speed at which innovations are made.

36. Taking these factors into consideration, it is my opinion that a person having ordinary skill in the art at the time of the earliest claimed priority date for the Asserted Patents would have had a bachelor's degree in electrical engineering, computer engineering, computer science, or a related field, or an equivalent technical degree or equivalent work experience, and an additional two years of education or experience in computer vision software and systems. More education can supplement practical experience and vice versa.

## **V. OVERVIEW OF THE ASSERTED PATENTS**

### **A. The '431 Patent**

37. The '431 Patent is titled "CAMERA BASED SENSING IN HANDHELD, MOBILE, GAMING, OR OTHER DEVICES." The patent was filed on July 12, 2010 and issued April 26, 2011. The patent claims priority to July 8, 1999.

### **B. The '924 Patent**

38. The '924 Patent is titled "CAMERA BASED SENSING IN HANDHELD, MOBILE, GAMING OR OTHER DEVICES." The patent was filed on March 18, 2011 and issued June 5, 2012. The patent claims priority to July 8, 1999. The patent claims it is a continuation of the application that issued as the '431 Patent, although the specification was amended on December 14, 2011 to include the Figure 18 embodiment. *See* '924 Patent Prosecution History, Dec. 14, 2011 Applicant Arguments/Remarks Made in an Amendment.

### **C. The '079 Patent**

39. The '079 Patent is titled "MORE USEFUL MAN MACHINE INTERFACES AND APPLICATIONS." The patent was filed on December 14, 2012 and issued October 8, 2013. The patent claims priority to November 9, 1998.

**D. The '949 Patent**

40. The '949 Patent is titled "CAMERA BASED INTERACTION AND INSTRUCTION." The patent was filed on August 7, 2013 and issued November 4, 2014. The patent claims priority to May 11, 1999.

**VI. DISPUTED CLAIM TERMS****A. '431 Patent****1. "means for controlling a function of said apparatus using said information"**

<b>Claim Term</b>	<b>Plaintiff's Proposed Construction</b>	<b>Defendants' Proposed Construction</b>
"means for controlling a function of said apparatus using said information"	<p>Structure: A computer with at least one microprocessor specially programmed for controlling said apparatus using said information.</p> <p>Function: "controlling a function of said apparatus using said information"</p>	<p>Means-plus-function</p> <p><b>Function:</b> "controlling a function of said [handheld computer] apparatus using said information [concerning a position or movement of said object positioned by a user operating said object]"</p> <p>The dependent claims currently asserted by Plaintiff further add to the function, including: (1) wherein said object is a finger (Claim 8)</p> <p><b>Structure:</b> Indefinite</p>

41. I understand the parties agree this limitation is a means-plus-function limitation to which 35 U.S.C. § 112, ¶ 6 applies. I agree that the claim does not recite structure for performing the claimed function to rebut the presumption against means-plus-function treatment, and thus is subject to 35 U.S.C. § 112, ¶ 6.



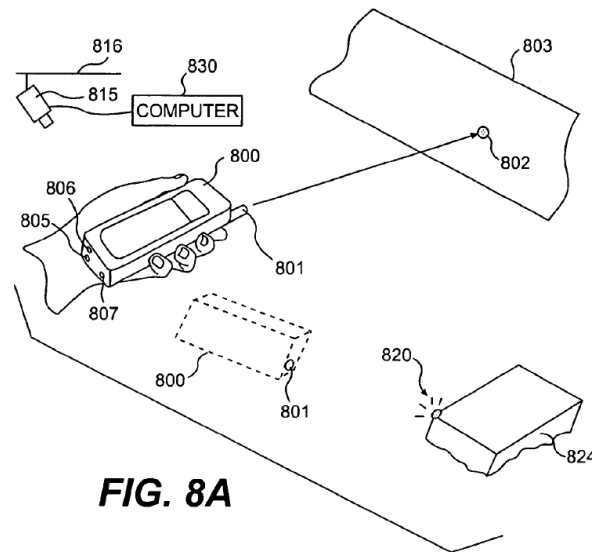
42. The parties also appear to generally agree as to the recited function. Defendants have simply clarified the antecedent basis for certain terms: (1) “said apparatus” refers to “a handheld computer apparatus” recited in the preamble, and (2) “said information” refers to “information concerning a position or movement of said object positioned by a user operating said object” that is determined by the “computer means.” I agree with Defendants’ recitation of the claimed function, which makes clear the entirety of the claimed function.

43. I also agree with Defendants that Claim 8 further adds to the claimed function. Claim 8 recites “wherein said object is a finger.” Under Claim 8, the “means for controlling” must specifically control a function of the handheld computer apparatus using information concerning a position or movement of a finger positioned by a user operating the finger. Thus, for Claim 8, the specification must disclose an algorithm for this particular claimed function wherein the object is a finger.

44. The specification does not disclose to a person of ordinary skill in the art any structure corresponding to the claimed function of controlling a handheld computer apparatus using information concerning a position or movement of an object positioned by a user operating said object.

45. The patent only discloses using a handheld device in the Figure 8 embodiment. ’431 Patent at FIG. 8A, FIG. 8B, 11:53-13:44. But the patent never describes controlling the handheld device using position or movement information of an object positioned by a user.

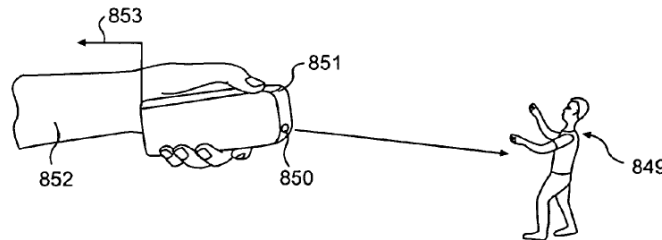
46. The patent describes signaling a fax unit to print data using a TV camera 815 and computer 830, both of which are separate from and external to the cellular phone 800 as shown below in Figure 8A. ’431 Patent at FIG. 8A, 12:42-58.



47. The computer 830 analyzes images from TV camera 815 of targets 805-807 on the cell phone to “determine[] the cell phone position and/or orientation or motion and commands the fax to print if such is signaled by the cell phone position orientation or motion chosen.” ’431 Patent at 12:42-52. The computer 830 uses the position and movement of the cell phone to control a function of the fax unit 824, not a function of the cell phone 800. And it does so using position and movement information of the cell phone, not of a separate object positioned by the user. Nor does this embodiment disclose an algorithm for how the position and movement information is used to control the fax unit. Instead, it simply describes the function of using position and movement information to command a fax, without describing how to implement the function. Thus, this embodiment does not disclose structure for performing the claimed function.

48. The patent then discloses an embodiment illustrated in Figure 8B wherein the camera and requisite computer are located in the handheld device, and the image captured by the camera 850 of the cell phone 851 is transmitted to a remote location and displayed, and more

specifically, images of objects that are recognized by the computer. '431 Patent at FIG. 8B, 12:59-13:16.



**FIG. 8B**

49. This embodiment does not disclose using position or movement information of an object positioned by a user to control the cell phone, let alone an algorithm for doing so, and thus does not disclose sufficient structure for performing the claimed function.

50. The patent then further refers to the TV camera 815 of Figure 8A as detecting the presence of a laser pointer projected from the cell phone 800 onto a spot 820 on the fax unit 824, “and via computer memory it is known that this is a device to be energized or connected in connection with the cell phone.” '431 Patent at 13:26-33. This embodiment again does not describe controlling a handheld device using position or movement information of an object positioned by a user, let alone an algorithm for doing so, and thus does not provide corresponding structure to the claimed function.

51. The patent then goes on to describe pointing the camera in a handheld device at a TV screen with an email message “to obtain this image, recognize it through known character recognition techniques, and process it for transmission if desired” or “say the message to the user of the phone through the speaker of the cell phone.” '431 Patent at 13:34-42. The patent notes that “[s]uch a technique is not required if means exist to directly transmit the incoming information to the cell phone, but this may not be possible.” '431 Patent at 13:42-44. This again

does not describe using any position or movement information—let alone that of an object positioned by a user (as opposed to characters of an email message displayed on a TV screen on a car dashboard, none of which is positioned by a user)—to control a handheld device, nor an algorithm for doing so, and thus does not describe sufficient structure for performing the claimed function.

52. While the Figure 9 embodiment of the patent discloses using a laser pointer to point at a “large screen display” to control a slider, knob, or switch on the display, such disclosures do not describe a function of a handheld computer apparatus as claimed. ’431 Patent at 13:45-14:9. The patent itself states that such display functions are intended for “a large screen display (e.g., 5 feet diagonal or more) where control features here disclosed are of most value.” ’431 Patent at 13:49-53. The ’431 Patent does not disclose controlling the small screen display of a handheld computer apparatus using position or movement information of an object positioned by a user. The patent focuses on displays apart from that of a handheld device, such as a TV screen on the dashboard of a car that the handheld device can be pointed at and obtain an email message from. ’431 Patent, 13:34-44. In fact, the ’924 Patent, which is a continuation-in-part of the ’431 Patent, further refers to the fact that a handheld device with a camera facing away from the device makes it so “there is no requirement to carry a computer display with you as with an infrared connection (not shown) such as known in the art one can also transmit all normal control information to the display computer 1951.” ’924 Patent at 26:6-10. The ’924 Patent goes on to explain that “[a]s displays become ubiquitous, this makes increasing sense—otherwise the displays get bigger the computers small trend doesn’t make sense if they need to be dragged around together,” and that “[a]s one walks into a room, one uses the display or displays in that room (which might themselves be interconnected).” ’924 Patent at 26:10-15. This

additional language in the '924 Patent was taken from U.S. Patent App. No. 09/433,297 (U.S. Patent No. 6,750,848), which the '431 Patent says is incorporated by reference. '924 Patent Prosecution History, Dec. 14, 2011 Applicant Arguments/Remarks Made in an Amendment at 7; '431 Patent at 1:22-24.

53. This disclosure of using a handheld device with large screen displays separate from the device is consistent with the claims of the '431 Patent. Claim 9 recites the handheld computer apparatus of Claim 7 “**further including** a display function which is controlled,” which shows that a display function is separate from a handheld computer apparatus function. If the applicant had intended for the display function to be a type of handheld computer apparatus function, the applicant would have used antecedent basis to refer back to the Claim 7 function. That is what the applicant did in Claim 27 (“wherein **said** controlled function relates to a game”), which also stands in contrast with Claim 21 (“wherein a display is controlled” as opposed to saying said controlled function relates to a display), further showing that the handheld computer apparatus function is separate from a display function.

54. Moreover, Figure 9 and the related description does not disclose an algorithm for using position or movement information of an object positioned by a user to turn a knob, move a slider, or throw a switch on a display.

55. Thus, Figure 9 and the related description does not disclose structure corresponding to the claimed function.

56. I have also analyzed the references that the patent claims to have incorporated by reference. *See* '431 Patent at 1:47-2:3. To the extent that any of these references can be relied upon for providing structure for a means-plus-function limitation, each of these references does not disclose any algorithm for performing the claimed function.

57. Plaintiff's proposed structure is not sufficient structure for performing the claimed function as it does not identify the algorithm that the computer is programmed with. I have been informed that for computer-implemented functions that require special programming, the claim must be limited to the algorithm disclosed in the specification, as the structure of a microprocessor programmed to carry out an algorithm is limited by the disclosed algorithm. Plaintiff's proposed structure is any computer programmed to perform the claimed function. It does not limit the computer to any particular algorithm. The claimed function is not itself an algorithm. At best, it describes the input that would be provided to the algorithm (position and movement information of an object positioned by a user operating said object), but it does not describe how the computer uses the input to control the handheld computer apparatus, and thus does not describe an algorithm for performing the claimed function.

2. **“computer means within said housing for analyzing said image to determine information concerning a position or movement of said object”**

<b>Claim Term</b>	<b>Plaintiff's Proposed Construction</b>	<b>Defendants' Proposed Construction</b>
“computer means within said housing for analyzing said image to determine information concerning a position or movement of said object”	<p>No construction necessary. Not governed by 35 U.S.C. § 112 ¶ 6</p> <p>Alternatively, if the Court finds this term is subject to 35 U.S.C. § 112 ¶ 6:</p> <p>Structure: A computer with at least one microprocessor specially programmed programed to determine information concerning a position or movement of said object.</p> <p>Function: “analyzing said image to determine</p>	<p>Means-plus-function</p> <p><b>Function:</b> “analyzing said image to determine information concerning a position or movement of said object [positioned by a user operating said object]”</p> <p>The dependent claims currently asserted by Plaintiff further add to the function, including: (1) wherein said object is a finger (Claim 8)</p> <p><b>Structure:</b> “A computer programmed to (1) scan the</p>

	information concerning a position or movement of an object”	pixel elements in a matrix array on which said image is formed, and then calculate the centroid location “x,y” of a target on the object using the moment method disclosed in U.S. Patent No. 4,219,847 to Pinkney, as disclosed at 4:48-62; (2) add or subtract said image from prior images and identify movement blur, as disclosed at 6:64-7:14, 7:22-29; (3) obtain a time variant intensity change in said image from the detected output voltage from the signal conditioning of the camera means or by subtracting images and observing the difference due to such variation, as disclosed at 8:25-38; or (4) detect a change in color reflected from a diffractive, refractive, or interference based element on said object that reflects different colors during movement, as disclosed at 8:60-9:14.”
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58. I understand that because the word “means” is used, there is a rebuttal presumption that the “computer means” term is governed by 35 U.S.C. § 112, ¶ 6. I understand that the presumption can be rebutted if the claim itself recites sufficient structure for performing the claimed function.

59. A person of ordinary skill in the art would not understand the claim to recite sufficient structure for performing the claimed function. While the claim refers to a “*computer means*,” a computer by itself was not sufficient for analyzing an image from a camera to

determine information concerning a position or movement of an object positioned by a user. Rather, computers had to be specially programmed with particular computer vision algorithms designed to analyze an image as claimed. Without such software, the computer would have been unable to perform the claimed function.

60. My understanding of this limitation is consistent with representations made by the applicant during prosecution of a parent application (App. No. 10/893,534) that a “computer means” is a means-plus-function limitation. Claim 9 of the ’534 Application recited:

a computer means, connected to said at least one TV camera,

a) for analyzing the output of said TV camera and recognizing from the analysis a relative position of said marker with respect to the information on said board,

b) analyzing and recognizing, after a movement of said marker during the play of the game which is viewed by said TV camera, a new position of said marker with respect to the information on said board, and

c) for automatically generating, after the new position of said marker is recognized, a sensory output designed to be capable of being perceived by the person, said sensory output being different from a view of said board and marker thereon and being associated with the recognized new position of said marker with respect to the information on said board.

App. No. 10/893,534 Prosecution History, Oct. 29, 2007 Claims at Claim 9. The functions of the “computer means” in the ’534 Application included analyzing the output of a camera to determine position and movement information, similar to the “computer means” limitation of Claim 7 of the ’431 Patent.

61. The examiner rejected Claim 9 of the ’534 Application over the prior art, noting that “[n]ewly added limitations in a computer means phrase only represent intended use ‘for analyzing,’ ‘for recognizing,’ etc. do not specifically claim structure that would limit the



apparatus claimed.” App. No. 10/893,534 Prosecution History, Jan. 24, 2008 Final Rejection at 2.

62. In response, the applicant stated:

“By making this last statement, the examiner has in effect refused to give any patentable weight to the ‘function’ part of the computer ‘means.’ Such is contrary to 35 USC § 112, 6<sup>th</sup> ¶, as well as various sections of the MPEP and long established case law. As well appreciated, § 112, 6<sup>th</sup> ¶ specifically authorizes the use of ‘means or step plus function’ limitations in a claim. And when such limitations are used, it would be absurd to then ignore the ‘function’ portion as ‘only representing intended use’ as the examiner has done with the present claims.”

App. No. 10/893,534 Prosecution History, Apr. 24, 2008 Notice of Appeal at 2. The applicant then argued that because the “computer means” term is a means-plus-function limitation, the prior art failed to disclose the limitation because it did not disclose each and every function. *Id.* at 2-3. The applicant went on to further note that none of the prior art disclosed a structural equivalent of the “computer means” under 35 U.S.C. § 112, ¶ 6. *Id.* at 4-5. Thus, the applicant intended for a “computer means” term similar to that claimed in the ’431 Patent to be governed by 35 U.S.C. § 112, ¶ 6.

63. Accordingly, in view of the intrinsic evidence and my understanding of the relevant field at the time of the invention, I understand the “computer means” limitation of Claim 7 of the ’431 Patent to be a means-plus-function limitation governed by 35 U.S.C. § 112, ¶ 6.

64. The parties appear to generally agree as to the recited function. Once again, Defendants have simply clarified that “said object” refers back to “an object positioned by a user operating said object.” I agree with Defendants’ recitation of the claimed function, which makes clear the entirety of the claimed function.

65. I understand that for computer-implemented means-plus-function limitations, the specification must disclose an algorithm for performing the claimed function, not just a general purpose processor. The '431 Patent discloses a handful of such algorithms.

66. While the patent discloses multiple ways of scanning, or interrogating, the pixels in an image, it only discloses one algorithm for calculating the position of an object from those scanned pixels and three algorithms for calculating the movement of an object from those scanned pixels.

67. The '431 Patent discloses that the position of an object can be calculated from an image by using the moment method disclosed in the Pinkney patent (U.S. Patent No. 4,219,847) to calculate the centroid location of the object:

As an illustration, computer 220 determines, after the array 205 has been interrogated, that the centroid "x, y" of the pixel elements on which the target image lies is at pixel  $x=500$ ,  $y=300$  (including a sub-fraction thereof in many cases). The centroid location can be determined for example by the moment method disclosed in the Pinkney patent, referenced above.

'431 Patent at 4:56-62.

68. The '431 Patent discloses three algorithms for determining information concerning the movement of an object positioned by a user. The first is to add or subtract pixel intensities of successive images and then to identify a blur in the image, the blur representing movement of the object. '431 Patent at 6:64-7:29. The second is to detect a time variant intensity change in the image as the object moves its position by subtracting images and observing the difference due to such variation for objects that "twinkle" as they move. '431 Patent at 8:4-38. The last is to detect a change in color reflected from a diffractive, refractive, or interference based element on the object that reflects different colors during movement, such that a change in color represents movement. '431 Patent at 8:60-9:14.

69. I agree with Defendants' identification of structure, which accurately captures each of these algorithms.

70. I disagree with Plaintiff's identification of structure, which covers any computer programmed to perform the claimed function. Plaintiff's construction does not limit the computer to any particular algorithm. The claimed function is not itself an algorithm. At best, it describes the input to the algorithm ("said image") and the output ("information concerning a position or movement of said object"), but it does not describe how the computer analyzes the input to get the output, and thus does not describe an algorithm for performing the claimed function.

### 3. "display function which is controlled"

Claim Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"display function which is controlled"	No construction necessary. Not governed by 35 U.S.C. § 112 ¶ 6	Means-plus-function  <b>Function:</b> "controlling a display function"  <b>Structure:</b> "a computer programmed to (1) move a slider on the display as disclosed at 13:54-67, (2) turn a knob on the display as disclosed at 13:63-14:9, or (3) throw a switch on the display as disclosed at 13:63-13:67."

71. I understand that because the "display function" term does not use the word "means," there is a rebuttable presumption that the term is not governed by 35 U.S.C. § 112 ¶ 6. I also understand that this presumption may be rebutted if the term recites function without sufficient structure for performing that function.

72. This limitation recites a function without any structure for performing that function. Specifically, Claim 9 recites an “[a]pparatus according to claim 7, further including a display function which is controlled.” The claim does not recite any structure that controls the display function. Nor would one of ordinary skill in the art understand a “display function” to connote any particular structure. The term “display function” is not a term of art used to refer to any particular structure or class of structures. It is not used in common parlance to refer to anything specific, but instead is a generic term that does not bring up any particular structure to the mind of one of ordinary skill in the art. The term itself makes clear that it is just a type of “function,” such that the claim limitation is defined in purely functional terms without structure. The patent itself does not use the term “display function” outside of the claims.

73. Thus, I understand the “display function” term to be governed by 35 U.S.C. § 112 ¶ 6.

74. The ’431 Patent describes controlling a display function in the Figure 9 embodiment. Specifically, the patent discloses:

The user with the pointer, can point to an image or portion of the displayed image to be controlled, and then using the 55 action of the pointer move the controlling portion of the image, for example a “virtual slider control 930 projected on the screen whose lever 935 can be moved from left to right, to allow computer 910 sensing the image (for example by virtue of TV camera 940 looking at the screen as disclosed in 60 copending applications) to make the appropriate change, for example in the heat in a room.

’431 Patent at 13:54-62.

75. The patent also discloses that:

Alternatively one can also point at the object using ones fingers and using other aspects of the invention sense the motions of ones fingers with respect to the virtually displayed 65 images on the screen, such as turning of a knob, moving of a slider, throwing a Switch etc.

'431 Patent at 13:63-67.

76. From these disclosures, one of ordinary skill in the art would understand that the corresponding structure for controlling a display function is to turn a knob, move a slider, or throw a switch on the display. This is captured by Defendants' proposed construction.

77. While the patent does not disclose an algorithm for controlling the display based on position or movement information of an object positioned by a user, I understand the control of the display function to be separate from the "means for controlling" as I explained above, and Claim 9 does not itself require that this separate display function is controlled based on the position or movement information recited in Claim 7. Otherwise, if the "display function" were treated as a function of the handheld computer apparatus that is controlled by the "means for controlling," which is not what the claim recites, then the patent does not disclose sufficient structure for the reasons I explained above for the "means for controlling" term.

#### 4. "sensing means associated with said device"

Claim Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"sensing means associated with said device"	<p>No construction necessary. Not governed by 35 U.S.C. § 112 ¶ 6</p> <p>Alternatively, if the Court finds this term is subject to 35 U.S.C. § 112 ¶ 6:</p> <p>Structure: Electro-optical sensor.</p> <p>Function: "electro-optically sensing light reflected from at least one finger"</p>	<p>Means-plus-function</p> <p><b>Function:</b> "electro-optically sensing light reflected from said at least one finger"</p> <p><b>Structure:</b> "a camera"</p>

78. I understand that because the “sensing means” term uses the word “means,” there is a rebuttable presumption that 35 U.S.C. § 112 ¶ 6 applies. The claim itself does not recite any structure for performing the claimed function that would rebut that presumption. The “sensing” prefix before the word “means” does not describe or impart any structure but instead merely describes the function performed. Thus, I understand this term to be governed by 35 U.S.C. § 112 ¶ 6.

79. The parties generally agree on the claimed function, but Defendants’ proposed construction makes clear that the “sensing means” must sense light not from just any finger, but specifically from a finger that is moved in space in order to signal a command to the handheld computing device. I agree with Defendants’ proposed function, which more closely aligns with language of the claim than Plaintiff’s.

80. The patent only describes a camera as performing the claimed function. *See, e.g.*, ’431 Patent at 7:22-25 (“For example, consider FIG. 3A, where a human 301 moves his finger 302 in a rapid up and down motion, creating different image positions sequentially in time of bright target ring 320, 320’ on his finger, as seen by camera 325.”), 16:10-15 (“In fact in the latter sense, the camera could be instructed to detect ones finger or hand movement to do this function for example, wherever one desired to rest ones hand (within the camera field of view at least.”).

81. I disagree with Plaintiff’s proposed structure of an “electro-optical sensor.” The patent only refers to an “electro-optical sensor” twice in the patent using the same language each time. Specifically, the patent states:

The invention herein and disclosed in portions of other copending applications noted above, comprehends a combination of one or more TV cameras (*or other suitable electro-optical sensors*) and a computer to provide various position and orientation related

functions of use. It also comprehends the combination of these functions with the basic task of generating, storing and/or transmitting a TV image of the scene acquired—either in two or three dimensions.

'431 Patent at 3:15-22, 11:54-61.

82. First, this sole disclosure in the patent of an electro-optical sensor does not state that any electro-optical sensor may be used with the invention. The patent makes clear that the invention comprehends using only “suitable” electro-optical sensors. The patent does not identify what specific electro-optical sensors are suitable for the invention. The patent only describes a camera as being suitable. '431 Patent at 3:15-22, 11:54-61.

83. Furthermore, this disclosure does not link a generic electro-optical sensor to the function of electro-optically sensing light from a finger that is moved in space in order to signal a command to a handheld computing device. In fact, the patent does not link a generic electro-optical sensor to *any* function. The patent only states that suitable electro-optical sensors other than a TV camera may be used with the invention in conjunction with a computer to provide “various position and orientation related functions of use,” failing to specify what specific functions disclosed amongst the 25 columns of written description a generic electro-optical sensor (as opposed to a TV camera) can perform. This is important because not all electro-optical sensors are designed to sense light from an object, such as a finger, moving in space. For example, photoplethysmography (PPG) sensors are used in some systems that are not designed to sense light from a finger moving in space, but rather require the finger or other body part to be in stationary physical contact with the sensor. Thus, the patent does not describe what specific electro-optical sensors are suitable for the particular claimed function of sensing light reflected from a finger that is moved in space, only that a camera may be used to perform said function.

84. Thus, I also agree with Defendants’ proposed structure of “a camera” for the “sensing means” term.

**5. “a camera means associated with said housing for obtaining an image using reflected light of at least one object positioned by a user operating said object”**

<b>Claim Term</b>	<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
“a camera means associated with said housing for obtaining an image using reflected light of at least one object positioned by a user operating said object”	<p>No construction necessary. Not governed by 35 U.S.C. § 112 ¶ 6</p> <p>Alternatively, if the Court finds this term is subject to 35 U.S.C. § 112 ¶ 6:</p> <p>Structure: Electro-optical sensor.</p> <p>Function: “obtaining an image using reflected light of at least one object positioned by a user operating said object”</p>	<p>Not means-plus-function</p> <p>“a camera associated with said housing for obtaining an image using reflected light of at least one object positioned by a user operating said object”</p>

85. I understand that because the word “means” is used, there is a rebuttal presumption that the “camera means” term is governed by 35 U.S.C. § 112, ¶ 6. I understand that the presumption can be rebutted if the claim itself recites sufficient structure for performing the claimed function.

86. A person of ordinary skill in the art would understand that the word “camera” in the claim provides sufficient structure for performing the claimed function. It was known in the art that cameras could obtain an image using reflected light of an object positioned by a user. The patent confirms that a camera is the structure for performing the claimed function. *See, e.g.*, ’431 Patent at 7:22-25 (“For example, consider FIG. 3A, where a human 301 moves his finger



302 in a rapid up and down motion, creating different image positions sequentially in time of bright target ring 320, 320' on his finger, as seen by camera 325.”), 16:10-15 (“In fact in the latter sense, the camera could be instructed to detect ones finger or hand movement to do this function for example, wherever one desired to rest ones hand (within the camera field of view at least.”).

87. The parties agree that this limitation is not means-plus-function. However, Plaintiff proposes that any electro-optical sensor is a “camera means,” whereas Defendants propose that only a camera is a “camera means.” I agree with Defendants. The term “camera” is what provides sufficient structure in the claim to rebut the means-plus-function presumption. It would not make sense for a “camera means” to cover electro-optical sensors other than a camera. To broaden the claim that way would be to suggest that the term “camera” provides no structural limitation to the claim, which is not how one of ordinary skill of the art would read the claim.

#### 6. “means for transmitting information”

Claim Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
“means for transmitting information”	Structure: A transmitter.  Function: “transmitting information”	Means-plus-function  <b><u>Function:</u></b> “transmitting information”  <b><u>Structure:</u></b> “cellular transceiver”

88. I understand the parties agree this limitation is a means-plus-function limitation to which 35 U.S.C. § 112, ¶ 6 applies, and they agree that the function is “transmitting information.” I agree that the claim does not recite structure for performing the claimed function

to rebut the presumption against means-plus-function treatment, and thus is subject to 35 U.S.C. § 112, ¶ 6, and I agree with the parties' recitation of the function.

89. The patent does not expressly disclose any structure in the handheld computer apparatus for transmitting information. However, the patent discloses that the handheld device may be a cell phone that transmits an image of an object over a mobile phone link: "This is illustrated in FIG. 8B, where an image of object 849 is acquired by camera 850 of cell phone 851 held by user 852 is transmitted over mobile phone link 853 to a remote location and displayed, for example." '431 Patent at 12:66-13:3. It was understood in the art that a cell phone that transmits data over a mobile phone link includes a cellular transceiver to perform such transmission. Thus, the specification implicitly discloses a cellular transceiver in disclosing that a cell phone may transmit an image over a mobile phone link, and links it to the function of transmitting information.

90. I disagree with Plaintiff's proposal that the corresponding structure may be any transmitter. The specification discloses transmitting information using a handheld device only over a mobile phone link. It does not disclose any other type of transmission for performing the claimed function other than transmitting over a mobile phone link, which would have been understood as utilizing a cellular transceiver and not any other type of transmitter or transceiver.

91. The corresponding structure is therefore a cellular transceiver as Defendants propose.

**B. '924 Patent**

1. “a computer within the housing . . . wherein the computer is adapted to perform a control function of the handheld device based on at least one of the first camera output and the second camera output”

Claim Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
<p>“a computer within the housing . . . wherein the computer is adapted to perform a control function of the handheld device based on at least one of the first camera output and the second camera output”</p>	<p>No construction necessary. Not governed by 35 U.S.C. § 112 ¶ 6</p>	<p>Means-plus-function</p> <p><b>Function:</b> “perform a control function of the handheld device based on at least one of the first camera output and the second camera output”</p> <p>The dependent claims currently asserted by Plaintiff add additional functions, including:</p> <p>(1) “determine a gesture based on at least one of the first camera output and the second camera output” (Claim 6);</p> <p>(2) “determine a facial expression based on at least one of the first camera output and the second camera output” (Claim 7);</p> <p>(3) “determine at least one of the position and the orientation of the object based on the second camera output” (Claim 8);</p> <p>(4) “recognize the object based on the second camera output” (Claim 10);</p> <p>(5) “determine a reference frame of the object” (Claim 12)</p> <p>(6) “transmit information over an internet connection” (Claim 14)</p> <p><b>Structure:</b> Indefinite</p>

92. The term “computer” as used in the claims would have been understood by one of ordinary skill in the art to refer to a generic computing component. Computers were not capable of performing a control function based on at least one of a first camera output and a second camera output on their own, but rather required additional software to do so. A computer without the additional software was not sufficient structure for performing the claimed function.

93. That a computer does not provide sufficient structure for performing the claimed function is further supported by statements by the patentee during prosecution of a parent application that a “computer means” term for performing a similar image analysis function—discussed above with respect to the “computer means” term for the ’431 Patent—is means-plus-function. The claim in the application used the word “computer” in describing the means, and I understand that if a claim that uses the word “means” nevertheless recites structure in the claim itself for performing the function, then the term is not means-plus-function. Thus, in confirming that a “computer means” is means-plus-function, the applicant acknowledged that simply reciting a “computer” in the claim does not provide sufficient structure for performing the claimed function.

94. Furthermore, the claims and the specification also do not describe the physical connections between the computer and any other claimed components. Claim 1 only recites that the computer is somewhere within the device housing and uses at least one of the first camera output and second camera output without describing whether the computer is coupled to the cameras or whether it gets the camera outputs from some other means. The dependent claims also do not provide any detail on the structural connections of the computer. The patent only describes the connections of computers located outside the handheld device, and thus do not correspond to the claimed computer, which must be within the handheld device housing. *See,*

*e.g.*, '924 Patent at FIG. 8A. The claims and the patent also does not describe how the computer operates to perform a control function based on at least one of the first camera output and the second camera output.

95. That the computer is used as a generic term rather than specific structure that is sufficient for performing the claimed function is further evident from the fact that the claims recite the same computer as performing nine different functions:

- “perform a control function of the handheld device based on at least one of the first camera output and the second camera output” (Claim 1)
- “determine a gesture based on at least one of the first camera output and the second camera output” (Claim 6);
- “determine a facial expression based on at least one of the first camera output and the second camera output” (Claim 7);
- “determine at least one of the position and the orientation of the object based on the second camera output” (Claim 8);
- “recognize the object based on the second camera output” (Claim 10);
- “generate control instructions for a display that is separate from the handheld device” (Claim 11)
- “determine a reference frame of the object” (Claim 12)
- “perform a control function based on the first camera output and based on the second camera output” (Claim 13)
- “transmit information over an internet connection” (Claim 14)

96. I agree with Defendants that the function of the computer in Claim 1 is to “perform a control function of the handheld device based on at least one of the first camera

output and the second camera output.” The patent does not disclose any algorithm for performing a control function of a handheld device based on one camera output, let alone two. Therefore, the patent does not describe sufficient structure for performing the claimed function.

97. The dependent claims add further limitations to the function as noted in Defendants’ proposed construction. The patent does not disclose an algorithm for determining a gesture, for determining a facial expression, for determining orientation of an object, recognizing an object, or determining the reference frame of an object. Furthermore, a computer in a handheld device is not sufficient structure for transmitting information over an internet connection. Additional structure necessary to connect the handheld device to the internet is required. The patent does not disclose such structure.

### C. ’079 Patent

#### 1. “a processor adapted to determine the gesture performed in the work volume and illuminated by the light source based on the camera output”

Claim Term	Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
“a processor adapted to determine the gesture performed in the work volume and illuminated by the light source based on the camera output”	No construction necessary. Not governed by 35 U.S.C. § 112 ¶ 6	Means-plus-function  <b>Function:</b> “determine the gesture performed in the work volume and illuminated by the light source based on the camera output”  The dependent claims currently asserted by Plaintiff further add to the function, including: (1) determining a pointing gesture (Claim 19)  <b>Structure:</b> Indefinite

98. The term “processor” as used in the claims would have been understood by one of ordinary skill in the art to refer to a generic computing component. Processors were not capable of determining a gesture performed in a work volume and illuminated by a light source based on a camera output on their own, but rather required additional software to do so. A processor without the additional software was not sufficient structure for performing the claimed function.

99. That a processor does not provide sufficient structure for performing the claimed function is further supported by statements by the patentee during prosecution of a patent application by the same inventor that a “computer means” term for performing a similar image analysis function—discussed above with respect to the “computer means” term for the ’431 Patent and the “computer” term for the ’924 Patent—is means-plus-function. The claim in the application used the word “computer” in describing the means, and I understand that if a claim that uses the word “means” nevertheless recites structure in the claim itself for performing the function, then the term is not means-plus-function. Thus, in confirming that a “computer means” is means-plus-function, the applicant acknowledged that simply reciting a “computer” in the claim does not provide sufficient structure for performing the claimed function. Similarly, a processor does not connote sufficient structure for determining a gesture performed in a work volume and illuminated by a light source based on a camera output. A computer was understood in the art to include a processor as one of its necessary components to perform its computing function, along with other components such as memory. Since a processor is simply one component of a computer, it connotes even less structure than a computer. Thus, just as the applicant acknowledged with respect to a computer, a processor is also not sufficient structure for performing the claimed function and is therefore a means-plus-function limitation.

100. Furthermore, the claims and the specification also do not describe the physical connections between the processor and any other claimed components. Claim 1 only recites that the processor uses the camera output without describing whether the processor is coupled to the camera or whether it gets the camera output from some other means. The dependent claims and the specification also do not provide any detail on the structural connections of the processor. The claims and the specification also does not describe how the processor operates to determine a gesture performed in the work volume and illuminated by the light source based on the camera output.

101. I agree with Defendants that the function of the processor in Claim 11 is to “determine a gesture performed in the work volume and illuminated by the light source based on the camera output.” The specification does not disclose any algorithm for determining a gesture performed in the work volume and illuminated by the light source based on the camera output. At best, the specification simply states the function without providing an algorithm for performing the function.

102. For example, the specification discloses that “finger position data can be used to determine gestures such as pinch or grip, and other examples of relative juxtaposition of objects with respect to each other, as has been described in co-pending referenced applications.” ’079 Patent at 2:58-61. This disclosure does not explain how to determine a gesture from the finger position data, let alone from a camera output. It merely describes the function of determining a gesture and does not provide an algorithm for the claimed function.

103. The specification also discloses that “[f]inger gestures comprising a sequence of finger movements can also be detected by analyzing sequential image sets such as the motion of the finger, or one finger with respect to another such as in pinching something can be



determined.” However, the specification does not describe how the sequential images are analyzed in order to detect finger gestures, and therefore does not provide an algorithm for the claimed function of determining the gesture performed in the work volume and illuminated by the light source based on the camera output.

104. Therefore, the patent does not describe sufficient structure for performing the claimed function of determining the gesture performed in the work volume and illuminated by the light source based on the camera output.

105. The dependent claims add further limitations to the function as noted in Defendants’ proposed construction. Just as the patent does not disclose an algorithm for determining a gesture, it does not disclose any algorithm for determining a pointing gesture as required by Claim 19.

106. I have also analyzed the references that the patent claims to have incorporated by reference. *See* ’079 Patent at 1:15-50. To the extent that any of these references may be relied upon for providing structure for a means-plus-function limitation, each of these references does not disclose any algorithm for performing the claimed function.

#### **D. ’949 Patent**

1. **“a processing unit within the device housing and operatively coupled to an output of the electro-optical sensor, wherein the processing unit is adapted to: determine a gesture has been performed in the electro-optical sensor output, and control the digital camera in response to the gesture performed in the electro-optical sensor field of view, wherein the gesture corresponds to an image capture command, and wherein the image capture command causes the digital camera to store an image to memory.” (Claims 1-2);**  
  
**“a processing unit” (Claims 8-9);**  
  
**“processing unit operatively coupled to the sensor and to the digital camera, wherein the processing unit is adapted to: detect a gesture has been performed in the electro-optical sensor field of view based on an output of the electro-optical sensor, and correlate the gesture**

detected by the sensor with an image capture function and subsequently capture an image using the digital camera, wherein the detected gesture is identified by the processing unit apart from a plurality of gestures.” (Claims 13-14)

Claim Term	Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
<p>“a processing unit within the device housing and operatively coupled to an output of the electro-optical sensor, wherein the processing unit is adapted to: determine a gesture has been performed in the electro-optical sensor output, and control the digital camera in response to the gesture performed in the electro-optical sensor field of view, wherein the gesture corresponds to an image capture command, and wherein the image capture command causes the digital camera to store an image to memory”</p>	<p>No construction necessary. Not governed by 35 U.S.C. § 112 ¶ 6</p>	<p>Means-plus-function</p> <p><b>Function:</b> “determine a gesture has been performed in the electro-optical sensor output, and control the digital camera in response to the gesture performed in the electro-optical sensor field of view, wherein the gesture corresponds to an image capture command, and wherein the image capture command causes the digital camera to store an image to memory”</p> <p>The dependent claims currently asserted by Plaintiff further add to the function, including: (1) determining a gesture that includes a hand motion (Claim 2)</p> <p><b>Structure:</b> Indefinite</p>
<p>“processing unit”</p>	<p>No construction necessary. Not governed by 35 U.S.C. § 112 ¶ 6</p>	<p>Means-plus-function</p> <p><b>Function:</b> “determining a gesture has been performed in the electro-optical sensor field of view based on the electro-optical sensor output, wherein the determined gesture corresponds to an image capture command”</p>

		<p>The dependent claims currently asserted by Plaintiff further add to the function, including:</p> <p>(1) determining a gesture that includes a hand motion (Claim 9)</p> <p><b><u>Structure:</u></b> Indefinite</p>
<p>“processing unit operatively coupled to the sensor and to the digital camera, wherein the processing unit is adapted to: detect a gesture has been performed in the electro-optical sensor field of view based on an output of the electro-optical sensor, and correlate the gesture detected by the sensor with an image capture function and subsequently capture an image using the digital camera, wherein the detected gesture is identified by the processing unit apart from a plurality of gestures.”</p>	<p>No construction necessary. Not governed by 35 U.S.C. § 112 ¶ 6</p>	<p>Means-plus-function</p> <p><b><u>Function:</u></b> “detect a gesture has been performed in the electro-optical sensor field of view based on an output of the electro-optical sensor, and correlate the gesture detected by the sensor with an image capture function and subsequently capture an image using the digital camera, wherein the detected gesture is identified by the processing unit apart from a plurality of gestures”</p> <p>The dependent claims currently asserted by Plaintiff further add to the function, including:</p> <p>(1) determining a gesture that includes a hand motion (Claim 14)</p> <p><b><u>Structure:</u></b> Indefinite</p>

107. The term “processing unit” as used in the claims would have been understood by one of ordinary skill in the art to refer to a generic computing component. The term “unit” does not connote any structure, and a “processing unit” would be understood to simply be a generic

element for processing. Processing units were not capable of determining a gesture based on the output of an electro-optical sensor on their own, nor were they capable of controlling a digital camera to capture an image in response, but rather required additional software to do so. A processing unit without the additional software was not sufficient structure for performing the claimed functions for each of the three “processing unit” limitations.

108. That a processing unit does not provide sufficient structure for performing the claimed functions is further supported by statements by the patentee during prosecution of a patent application by the same inventor that a “computer means” term for performing a similar image analysis function—discussed above with respect to the “computer means” term for the ’431 Patent and the “computer . . .” term for the ’924 Patent—is means-plus-function. The claim in the application used the word “computer” in describing the means, and I understand that if a claim that uses the word “means” nevertheless recites structure in the claim itself for performing the function, then the term is not means-plus-function. Thus, in confirming that a “computer means” is means-plus-function, the applicant acknowledged that simply reciting a “computer” in the claim does not provide sufficient structure for performing the claimed function. Like a computer, a processing unit is a generic computing component that does not itself connote sufficient structure for determining a gesture based on the output of an electro-optical sensor and controlling a digital camera to capture an image in response. A computer was understood in the art to include a processing unit as one of its necessary components to perform its computing function, along with other components such as memory. Since a processing unit is simply one component of a computer, it connotes even less structure than a computer. Thus, just as the applicant acknowledged with respect to a computer, a processing unit is also not sufficient structure for performing the claimed function and is therefore a means-plus-function limitation.

109. Furthermore, the claims and the specification do not describe how the processing unit operates to determine a gesture based on the output of an electro-optical sensor and control a digital camera to capture an image in response.

110. I agree with Defendants' recitation of the claimed function for each of the three "processing unit" terms. The patent does not disclose any algorithm for determining a gesture based on the output of an electro-optical sensor or for controlling a digital camera to capture an image in response. Therefore, the patent does not describe sufficient structure for performing the claimed functions.

111. The dependent claims add further limitations to the function as noted in Defendants' proposed construction. Just as the patent does not disclose an algorithm for detecting a gesture or controlling a digital camera in response, it does not disclose any algorithm for determining a gesture that includes a hand motion.

## 2. "forward facing portion" / "forward facing light source"

Claim Term	Plaintiff's Proposed Construction	Defendants' Proposed Construction
"forward facing portion"	No construction necessary.	Indefinite
"forward facing light source"	No construction necessary.	Indefinite

112. Claims 1, 8, and 13 recite "a device housing including a forward facing portion" that encompasses a digital camera and a sensor or electro-optical sensor. Claims 5 and 16 recite that the device further includes "a forward facing light source."

113. The claims do not simply recite that the digital camera and sensor or electro-optical sensor are encompassed within the device housing, but that they are encompassed specifically within the "forward facing portion" of the housing, presumably to the exclusion of

devices with such components in a backward facing portion of the housing. However, the patent never uses the term “forward,” let alone the phrase “forward facing,” and it does not describe how to determine which portion of a device is facing forward as opposed to backward.

114. Because the patent never uses the terms “forward” or “forward facing,” it is unclear which embodiments, if any, depict the cameras in a “forward facing portion” of the housing. For example, while the camera lenses in the Figure 1 TV monitor are located on the same side as the TV display screen, the camera lens in the Figure 7 camera is located on the opposite side of the display.

115. The prosecution history provides no further clarity on how to determine which part of a device housing is the forward facing portion. At best, the applicant only implied that a “forward facing portion” is a particular portion of the “device housing,” but without specifying how to determine which portion of the housing it is: “However, the camera handoff system 120 is not a device housing, *let alone a forward facing portion* encompassing an electro-optical sensor and a digital camera.” ’949 Patent Prosecution History, August 14, 2014 Applicant Arguments/Remarks Made in an Amendment at 8 (emphasis added).

116. Without a clear description of what the forward facing portion of a device housing is, one of ordinary skill in the art cannot determine the scope of the claims with reasonable certainty. For example, if one side of a device has a digital camera and the other side has a digital camera and an electro-optical sensor, it is unclear whether the claim limitation is met or not because one cannot determine whether the forward facing portion is the side with just the digital camera, or the side with the digital camera and electro-optical sensor.

117. The same issues apply to the “forward facing light source” term. The intrinsic evidence provides no guidance on what is “forward facing” let alone what is a “forward facing

light source.” It is unclear from the intrinsic evidence how to determine whether a light source is forward facing or not, such that one of ordinary skill in the art cannot determine the scope of the claims with reasonable certainty.

**3. “the detected gesture is identified by the processing unit apart from a plurality of gestures”**

<b>Claim Term</b>	<b>Plaintiff’s Proposed Construction</b>	<b>Defendants’ Proposed Construction</b>
“the detected gesture is identified by the processing unit apart from a plurality of gestures”	No construction necessary.	Indefinite, including for lack of antecedent basis

118. While one of ordinary skill in the art may understand what it means to detect a gesture, it is unclear what it means to identify an already detected gesture apart from a plurality of gestures. Once the gesture has been detected, as recited elsewhere in the claim, it is unclear what is left to be identified, nor what it means to identify a detected gesture “apart from a plurality of gestures.” The claims and the specification do not describe what identifying a detected gesture apart from a plurality of gestures means.

119. Furthermore, it is unclear which detected gesture this claim term refers to. Claim 13 refers to two different gesture detections by two different components: (1) “a sensor adapted to detect a gesture in the digital camera field of view” and (2) “a processing unit . . . adapted to: detect a gesture has been performed in the electro-optical sensor field of view based on an output of the electro-optical sensor.” It is unclear to one of ordinary skill in the art whether “the detected gesture” in this claim term refers to the gesture detected by the processing unit or the gesture detected by the sensor.

120. Thus, a person of ordinary skill in the art cannot determine the scope of the claim with reasonable certainty.



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I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge.

Dated: July 16, 2021

A handwritten signature in black ink, appearing to read 'R. L. Stevenson', written over a horizontal line.

Robert Louis Stevenson, Ph.D.